

Forename: _____ Surname: _____

School / College / Institution: _____

Course date: _____

These Training and Accreditation Guidelines are based on, and should be used in conjunction with the following essential publications:

- Health and Safety Training Standards in Design and Technology: D&T Association.
- BS 4163:2021+A1:2022 Health and safety for design and technology in educational and similar establishments – Code of practice.
- Model Risk Assessments for D&T in Secondary Schools and Colleges: CLEAPSS.

Summary Overview**Please tick the boxes below to confirm the sections that you have completed in this document:**

1. Requirements relating to drilling machines.	☐
2. Practical Assessment – skills using drilling machines.	☐

The RDTHSC/Trainer will sign and date this form on completion.

RDTHSC/Trainer signature: _____

Date: _____

Delegate signature: _____

Date: _____

Please tick the individual requirements listed in the following sections to confirm your knowledge, skills and understanding, and that you have completed the Practical Assessments:

Assessment Task 1 Requirements Relating to <u>Drilling Machines</u> – what you should know and understand:		
Hazards	Safe system of working (control measures)	
Entrapment/entanglement.	- Long hair and loose clothing should be secured. - Dangling jewellery should be removed. - Gloves or bandages should not be worn. - An apron or work coat should be worn. - Fixed guards (removable only with a tool) or interlocked guards must enclose drive pulleys and belts.	☐
Ejection and dust.	- The chuck key must be removed before starting the machine and after the work is completed. - The chuck key should preferably be spring-loaded. - The chuck guard should extend to the bottom of the drill bit when it is in the uppermost position. - The table should be adjusted so that as the drill leaves the guard, it enters the workpiece. - When using a specialist printed circuit board drilling machine, the need for a guard should be determined by a specific risk assessment. - Drill bits should be ground and sharpened correctly. - Suitable eye protection should be available near the machine. This should conform to EN ISO 16321:2022 'E' rating. (Existing eye protection BS EN 166:2002 1B can continue in use until 2029). - Eye protection stickers should be visible on the machine. - Eye protection should be worn at all times.	☐
Unexpected spinning of hand-held workpieces.	Risk assessments should confirm appropriate clamping arrangements, e.g. use of a vice, clamping the workpiece to the table, depending upon the size of the drill and size/shape of material.	☐
Drill table slipping down, heavy objects falling from the table.	- Suitable footwear should be worn. - A safety collar stop should be used if no rack and pinion rise and fall mechanism is fitted.	☐
Electric shock/inadvertent starting of the machine.	The machine must have: - A means of electrical isolation. - Fused switch disconnecter. - Starter with overload protection and no-volt release. - Armoured cable to isolator. - A foot-operated emergency stop device that can quickly stop the machine in an emergency. - Electrical isolation before the position of the drive belt is changed.	☐
Sharp edges (drills, swarf etc.)	Swarf must be removed using a tool to avoid hand contact.	☐
Contact with fluids, oil and grease.	Contact with the skin should be kept to a minimum, and hands should be washed thoroughly after use.	☐
Lack of space around the machine.	Sufficient space around the machine to prevent the operator being pushed by passers-by.	☐
Flooring.	- Floor surface should not be slippery and should be kept free of loose items. - See BS 4163:2021+A1:2022 Section 6 Working Area Environment.	☐
Lighting.	- Adequate lighting should be provided. - See BS 4163:2021+A1:2022 Section 6 Working Area Environment.	☐

Teaching Strategies

- It is essential that a risk assessment is completed to cover the use of this machine by learners and colleagues. This will normally involve the adoption and adaptation of model risk assessments, e.g. BS 4163:2021+A1:2022.
- It is essential that a regular maintenance programme is put into operation and that a maintenance log is kept. This should involve daily, weekly and termly checks, covering general maintenance and identifying any faults that require repairs.
- The machine should be included in a planned maintenance programme that includes electrical safety inspections and tests.
- Learners should be aware of the hazards associated with the equipment and the precautions that should be taken during use.
- Before using the equipment, learners should be trained and assessed as competent, and a record of their training should be kept.
- Learners should be supervised at all times by a trained, competent person.
- Drilling machine health and safety rules should be available and observed.
- Demonstration of drilling machines to learners should include:
 - The position of all controls, i.e. workshop emergency stop buttons, isolator switch, start button and emergency foot stop button on the machine.
 - Explanation of safety hazards (loose clothing, eye protection, overcrowding etc.)
 - The use of eye protection and dust masks if required.
 - How to mark out correctly.
 - How to hold work securely.
 - The range of appropriate drills/bits.
 - Correct choice of feed/speed for size and type of drill and use of cutting fluid as required.
 - How to fit the drill bit correctly.
 - Safe removal of the chuck key.
 - Setting of the table height.
 - Setting of the depth stop.
 - Setting of the chuck guard.
 - The operation of the machine by one student at a time.
 - How to drill correctly.

Assessment Task 2 Practical Assessment –

what you should be able to demonstrate when using Drilling Machines:



Recognise types of drills suitable for use in school workshops and know how they should be sharpened, e.g.:

- HSS drill bits, wood boring bits, flat bits, forstner bits, plug cutters, stepped bits.

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Drill metal, e.g. mild steel and aluminium/aluminium alloy, to demonstrate:

- Marking out procedure.
- Selection of appropriate types of drill.
- Correct choice of speed for size and type of drill.
- Selection of appropriate clamping method, e.g. for flat and round bar and sheet materials.
- Correct drilling procedure, including feed speed and use of cutting fluid.

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Drill sheet plastics, to demonstrate:

- Marking out procedure.
- Selection of appropriate types of drill/bit.
- Correct choice of speed for size and type of drill/bit.
- Selection of appropriate clamping method.
- Correct drilling procedure, including feed speed.

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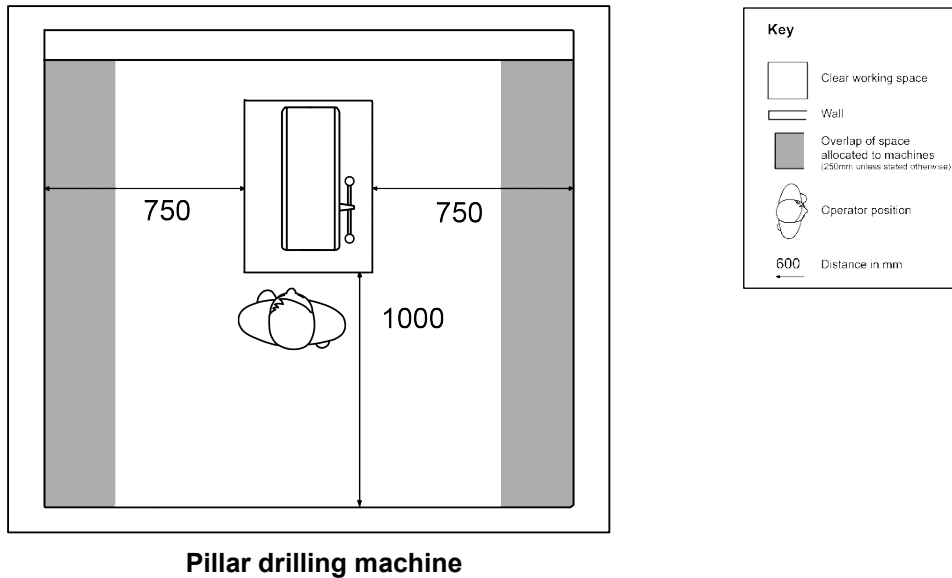
Drill wood, e.g. both solid and man-made board, to demonstrate:

- Marking out procedure.
- Selection of appropriate types of drill/bit.
- Correct choice of speed for size and type of drill/bit.
- Selection of an appropriate clamping method.
- Correct drilling procedure, including feed speed.

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Supplementary materials:

The space-allocation diagrams indicate the clear working space required on either side of the machine. Where machines are next to another, dimensions can be overlapped, as indicated by the shaded zone on the diagram. Distances in front of the machine are assumed to adjoin circulation routes. A 200mm space has been allowed at the back of the machine for cleaning and maintenance.



The following references provide additional notes and guidance to support training sessions:

<http://www.hse.gov.uk/metalworking/index.htm>